GammaCam Deployment

Accelerated Site Technology Deployment
Integrated Decontamination and Decommissioning Project

Need

Many surplus facilities within the Department Of Energy (DOE) complex contain various amounts of radioactive contamination, resulting in different radiation fields within the facilities. Before Decontamination and Decommissioning (D&D) activities can begin, the radiation fields must be quantified by Radiation Control Technicians (RCTs). They normally do this using hand-held survey equipment. A reduction in personnel exposure during these surveys is needed.

Technology Description

The GammaCam, manufactured by AIL Systems, Inc., can be used to identify radioactive hot spots remotely, reducing the exposure of personnel during initial entries into the facility. Once the location of the radioactive hot spots is known, steps can be taken to reduce worker exposure to radiation during Decontamination and Decommissioning activities.

The GammaCam identifies primary sources of radiation by providing a 2-dimensional color image of gamma radiation fields placed over a corresponding visual black and white video image of the area being scanned. Different colors represent the different radiation levels, red representing the highest and blue the lowest. The GammaCam provides relative field strength instead of quantified data, and it can be a great supplemental tool for manual probe searches.

The GammaCam sensor head is placed 10 to 15 feet from the area to be inspected and controlled remotely from a notebook computer. The computer can be as far as 100 feet from the head. Because of a remote pan and tilt feature added to the GammaCam by remote systems engineers at the Idaho National Engineering and Environmental Laboratory (INEEL), it can be completely controlled from outside a contaminated area. The INEEL team also designed and built an enclosure to protect the sensor head from contamination. The enclosure has forced airflow for cooling, with High Efficiency Particulate Air (HEPA) filters for the air coming in, and a positive pressure inside the enclosure to keep contaminants out.

Benefits

- Radiation sources can be located from a distance, increasing worker safety
- Indicates to RCTs where the hottest spots are so they can measure and shield those areas first
- Searches large areas in a short period of time

Status

The INEEL Remote Systems Engineering Department purchased the GammaCam from AIL Systems in 1996 with EM-40 funds. In 1998, the Accelerated Site Technology Deployment Integrated Decontamination and Decommissioning project funded development and construction of the enclosure protecting the head. The GammaCam and enclosure were used to look at the equipment used to dry containers containing Three Mile Island materials at the Test Area North Hot Shop in March of 1999. In July of 1999 engineers looked at the area again to see if processing the fuel caused any changes in radiation levels. The future plans for the GammaCam include using it at Test Area North in building 616. It is very highly contaminated and the GammaCam would be used to confirm previous surveys without incurring additional radiation exposure.

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